

WHAT IS CLAIMED IS:

1. A composite piezoelectric transducer, comprising:  
a ribbon-wound piezoelectric element having a  
winding of piezoelectric film ribbon wound against an  
electrically insulating material;

wherein the piezoelectric film ribbon has three  
layers: two outer conductive layers and an inner  
piezoelectric polymer film layer;

wherein the winding has a disk shape with a  
substantially circular top surface and bottom surface;

a face plate covering the top surface or bottom  
surface, the face plate operable to couple acoustic  
activity between the piezoelectric element and the  
environment external to the transducer; and

a pair of electrically conductive leads, one to each  
conductive layer.

2. The transducer of Claim 1, wherein the  
conductive layers are a metalized film.

3. The transducer of Claim 1, wherein the inner  
piezoelectric polymer film layer is made from a  
polyvinylidene difluoride material.

4. The transducer of Claim 1, wherein the  
insulating material is a plastic material.

5. The transducer of Claim 1, wherein the  
insulating material is a elastomer material.

6. The transducer of Claim 1, further comprising a rigid backing on the disk surface opposing the face plate.

7. A composite piezoelectric transducer, comprising:  
a ribbon-wound piezoelectric element having a first winding of piezoelectric film ribbon wound against a second winding of piezoelectric film ribbon;

wherein each piezoelectric film ribbon has three layers: two outer conductive layers and an inner piezoelectric polymer film layer;

wherein the winding has a disk shape with a substantially circular top surface and bottom surface;

a face plate covering the top surface or bottom surface, the face plate operable to couple acoustic activity between the piezoelectric element and the environment external to the transducer; and

a pair of electrically conductive leads, one lead to each conductive layer.

8. The transducer of Claim 7, wherein the conductive layers are a metalized film.

9. The transducer of Claim 7, wherein the inner piezoelectric polymer film layer is made from a polyvinylidene difluoride material.

10. The transducer of Claim 7, further comprising a rigid backing on the disk surface opposing the face plate.